

S/015/0043  
Task ID# 5741  
cc: Wayne

# **Notice of Proposed Operations**

**For**

**Miller Rock Mine**

**Proposal for Continued Activity under Surface Management  
Regulations**

**43 CFR 3809**

**RECEIVED**

**NOV 26 2013**

**DIV. OF OIL, GAS & MINING**



# **Notice of Proposed Operations**

**For**

## **Miller Rock Mine**

### **Proposal for Continued Activity under Surface Management Regulations**

**43 CFR 3809**

**UTU-69857**

**Miller Rock UMC 162155 Unpatented Mining Claim ( T. 22 S., R. 6E., SEC. 26,  
SLM ) Emery County , UT. ( fig 1 )**

**Applicant / Operator :**

**Hub Research & Development Co., Inc. / Bret W. Clark President**

**377 West 1500 South Salt Lake City, Utah 84115-5121**

**(801) 466-0056 / (801) 466-1073 Fax**

**Taxpayer ID Number: 87- 0257076**

**Total Area of Disturbance Approximately 2.36 Acres (Bonded)**

**Proposal for the continuation of mining activities relating to the annual procedures of the "Miller Rock Mine" site as shown in ( fig 1 ) Including but not limited to the following : Continued reduction of ore stockpile, Continued maintenance of all roads and or trails, Proposed area of reclamation and or cleanup, continued general mine and or mine site maintenance.**



## **PROPOSAL FOR AREA MANAGEMENT**

Under this proposed plan of operation no additional areas of surface disturbance will occur. All projected surface operations will be contained within the areas of pre-existing disturbance. See area map ( fig 1 )

## **OPERATIONS / SURFACE AREA REDUCTION OF ORE STOCKPILE**

Continued removal of ore stockpile in area shown in ( fig 2 ) will be conducted by the use of a "skid steer" front end loader. Material will then be conveyed by truck via the appointed route as shown in ( fig 3 ) No additional equipment will be required.

## **ROAD/TRAIL MAINTENANCE**

Continued maintenance of all roads and or trails ( fig 4 ) is proposed to prevent degradation to the surrounding areas. " Silt traps" or "Silt Dams" have been proven successful in the prevention of natural weather erosion and will be maintained at strategic points within the existing earthen berms of the mine trail road, as shown in ( fig 5 ) Required equipment : Backhoe / Skid Steer loader.

## **MINE / PORTAL MAINTENANCE**

Mine / Mine Portal Maintenance is conducted to insure continued mine safety as well as mine security in the prevention of unauthorized civilian access. See ( fig 6 )

## **SURFACE AREA CLEAN UP**

Continued surface area clean up remains a priority under this plan and has been projected to include the removal of all non-essential or non-operational equipment remaining on site, as well as any remaining surface debris that may have accumulated under past operation or by unauthorized civilian dumping. See ( fig 7 ) Required equipment will consist of a small loader, flatbed trailer and or flatbed truck.



## **PROPOSED RECLAMATION**

The proposed area of reclamation is shown highlighted in blue on the accompanying map. See (fig 8) Please Note: This area has naturally re-seeded and will be closely monitored over the period of recovery for method evaluation. Therefore no assertion of reclamation will be reported until such time as a full and complete recovery has been deemed to have occurred by all parties.

## **SITE MANAGEMENT / AREA MONITORING**

As area operations remain seasonal at this site, site management includes regular area monitoring during off season periods of operation to insure the continued stability of the site as well as to maintain the overall safety and security of the site.

## **RECLAMATION BOND / FINANCIAL GUARANTEE**

A 2006 Division approved Financial Guarantee or Bond was previously issued for this site and remains in place for the reclamation of all current areas of existing disturbance associated with the "Miller Rock" mine site. No additional areas of disturbance have since occurred nor been proposed within any subsequent plan. A current or updated surface reclamation cost estimate has been prepared via independent evaluation and is herein provided for division review and or approval. See (Attachment)

## **PLAN OBJECTIVES**

- To continue all site operations in accordance with division approval.
- To continue in the reduction and removal of ore stockpile.
- To keep all proposed disturbances within pre-existing boundaries.
- To continue to maintain the integrity of all roads and or trails.
- To maintain stability and to prevent area degradation.
- To locate and minimize unnecessary areas of surface impact.
- To reclaim such areas when possible.

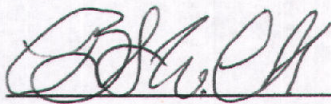


## OPERATIONAL HISTORY

The operations of the Miller Rock Site have been ongoing since its location nearly seventy years ago. I have personally served as the principle overseer for many of those years and look forward to serving in this capacity for many more.

As my father and grandfather before me, we have taken very seriously our responsibility in the stewardship and protection of Miller Canyon. These Locations have been the life blood of our family for more than four generations and remain vital to our continued operations.

Through our combined mutual cooperation we will not only be able to preserve the unique heritage of this site, but we can help to insure the future beauty and integrity of Miller Canyon for many generations to come.



Bret W. Clark

President ( Hub Research & Development Co., Inc. )

August 20, 2012



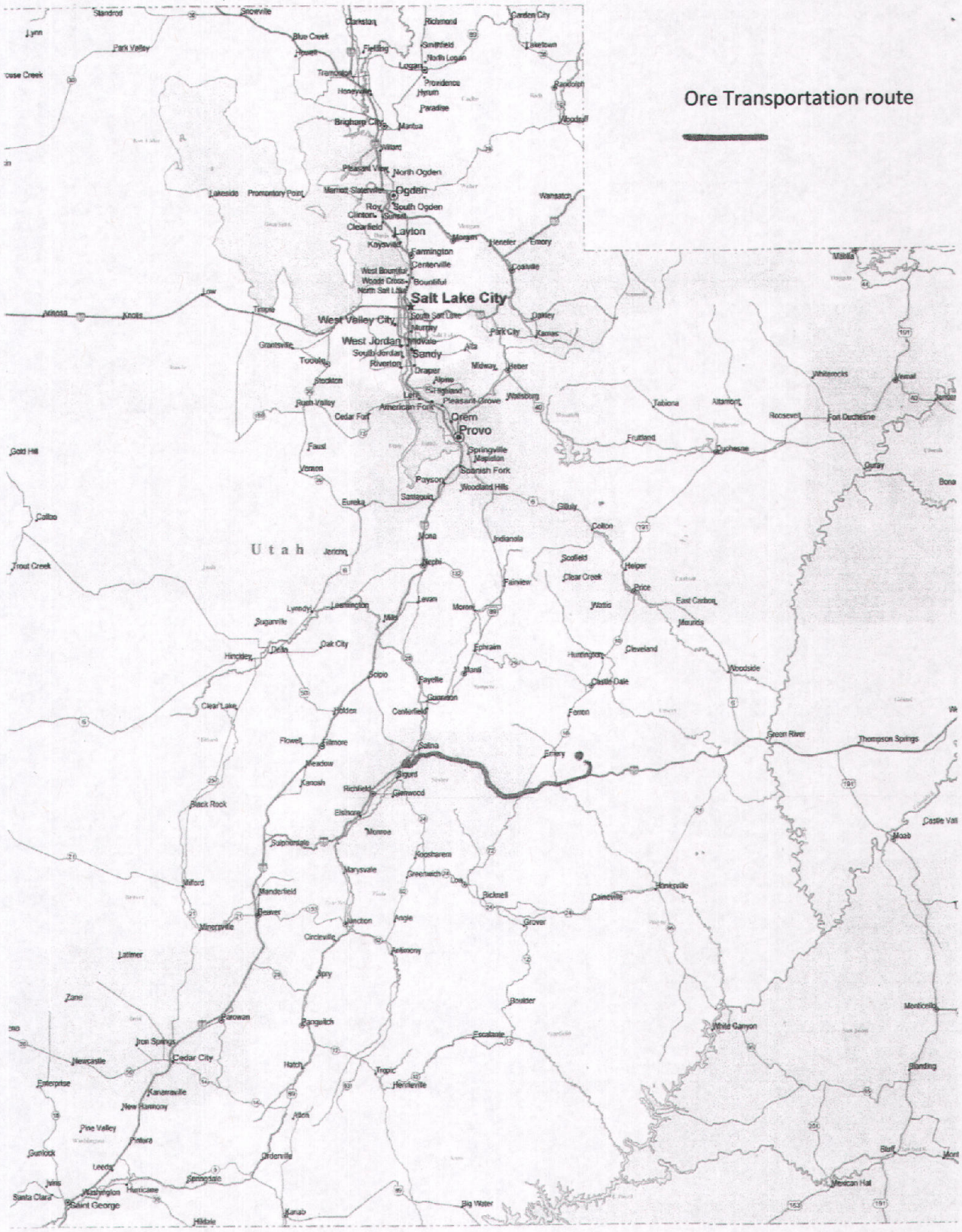






( fig 2)





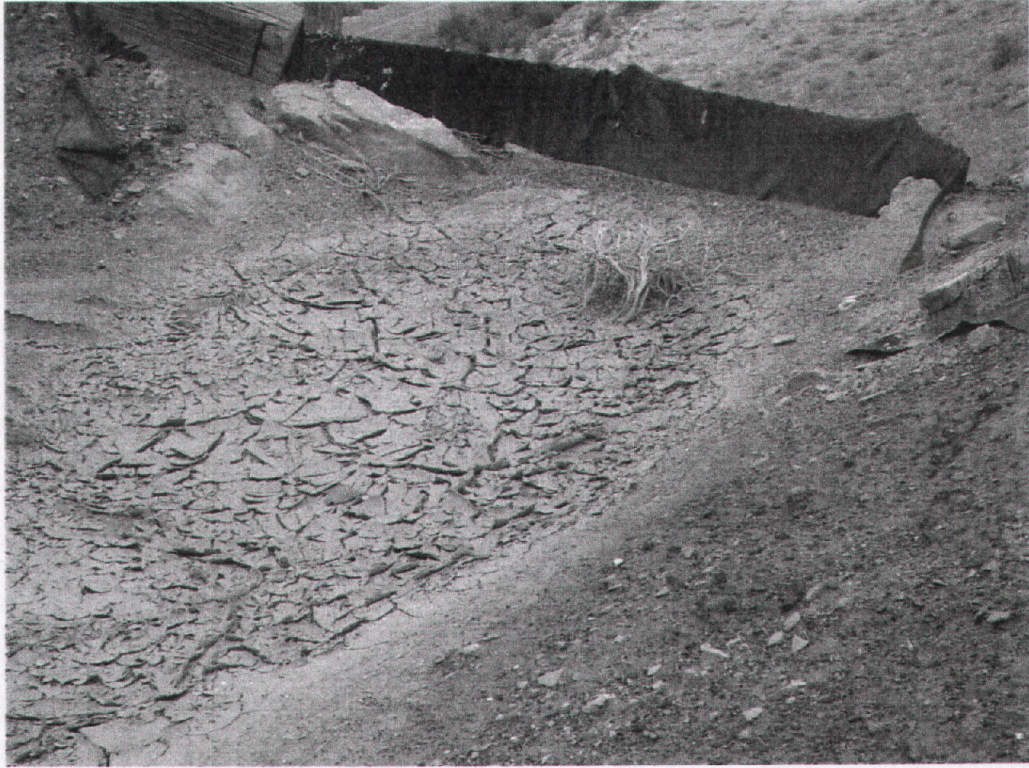
( fig 3 )



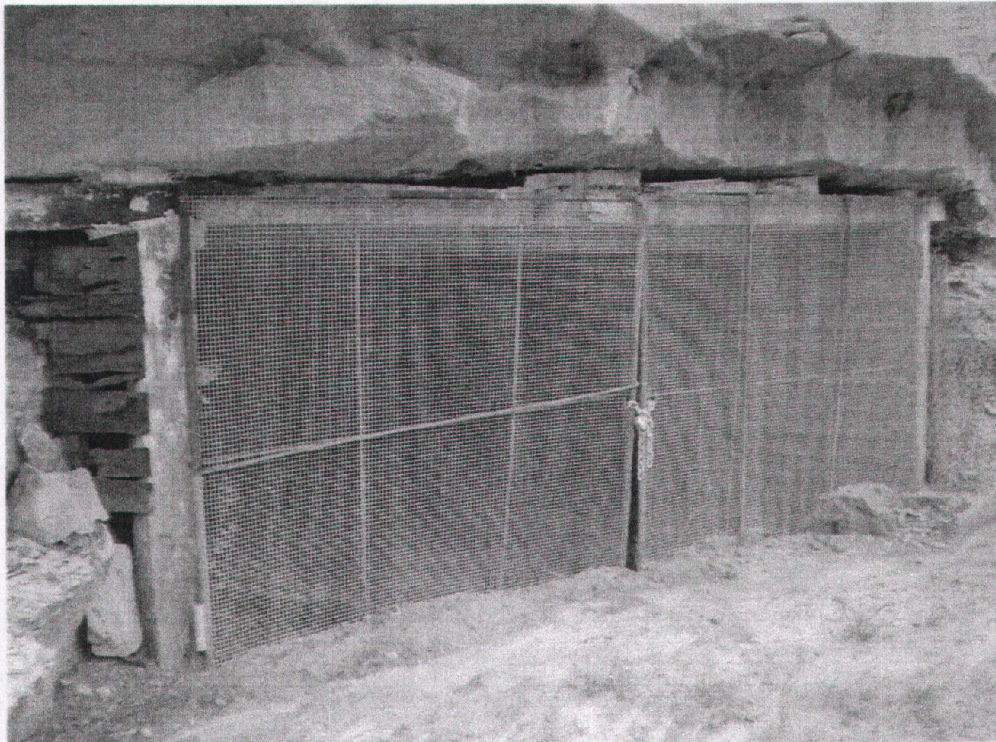


( fig 4)





( fig 5)



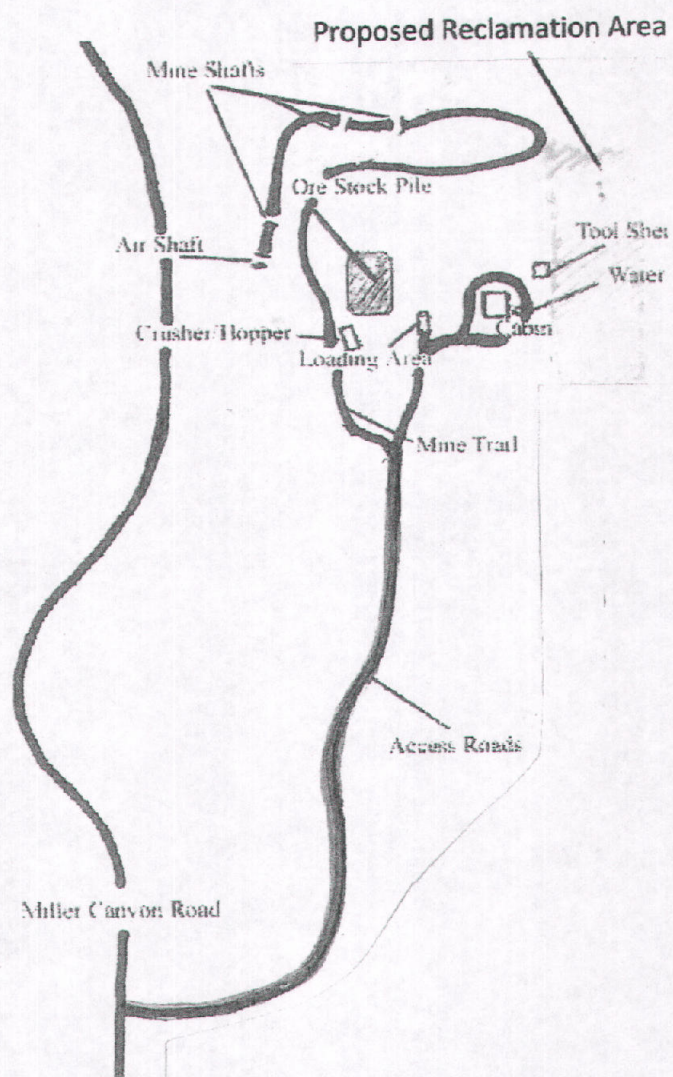
( fig 6)





( fig 7)





( fig 8)



# ***Denning Construction***

13726 S. Hackamore Circle, Draper, Utah 84020  
1967 N. Cascade Canyon Drive, St George, Utah 84770  
(801) 556-6776 Cel  
e-mail [rquindenning@hotmail.com](mailto:rquindenning@hotmail.com)

## ***Estimate***

**Scope of Work:** Reclaim the disturbed area of the Brett Clark Mine and revegetate. .

**Location:** Brett Clark Mine, Emery County, Utah

### **Specifications:**

Reclaim all disturbed roads and site consisting of about 4.51 acres.	\$4,321.60
Seal mine portals with solid grouted cmu block.	\$5,200.00
Demolish and haul away existing wood structure.	\$603.80
Revegetate area	\$1,465.75

<b>Total Cost</b>	<b>\$11,591.15</b>
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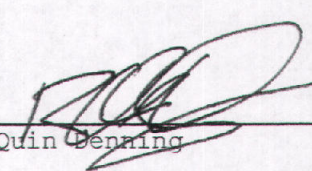
**Payment Schedule:** 50% Down - Balance Due upon completion  
(Note Any amounts not paid as agreed will be charged a finance charge of 1.5% per month along with all reasonable legal and collection fees.

### **Job Guarantee:**

This job to be completed in a timely manner. All work to be preformed in a good workmanlike fashion.

Submitted by

February 10, 2010

  
R Quin Denning



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 1**  
**DESCRIPTION OF THE WORST-CASE RECLAMATION SCENARIO**

Reclaim roads and affected site for the Brett Clark Mine.  
Grade site to bury or cover existing roads and revegetate.

Bury mine tailings. Remove existing wood structure. Remove  
all debris from site.

Seal existing mine portals with concrete block grouted solid.

**Assumptions:**

All equipment to be removed by owner.

**Data Source(s):**

Site visit



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 2**  
**STRUCTURE DEMOLITION AND DISPOSAL COSTS**

**Structures to be demolished:**

Item	Construction Material	Volume (cubic feet)	Unit Cost Basis (\$)	Demolition Cost (\$)
Cabin	Wood	572		\$328.80
Subtotal				\$328.80

**Other items to be demolished (paved roads, conveyors, utility poles, rail spurs, etc.):**

None

Subtotal = \$ \_\_\_\_\_

**Debris Handling and Disposal Costs:**

Hauling 1 load \$275.00

Subtotal = \$ \$275.00

**TOTAL DEMOLITION AND DISPOSAL = \$ \$603.80**

**Data Source(s):** Site Visit



**WORKSHEET 3**  
**MATERIAL HANDLING PLAN SUMMARY**

[illegible]



Prepared by: \_\_\_\_\_

**WORKSHEET 4A**  
**EARTHWORK QUANTITY**

Cross-Section/ Station	Distance Between Stations (ft)	End Area (ft <sup>2</sup> )	Volume (yd <sup>3</sup> )*	Adjust- ment Factor * (%)	Adjusted Volume (LCY)
NA					
<b>TOTALS</b>					

\* See discussion of material volume estimates in Chapter 2, Step 2, Part II. B. of the Handbook.  
Select adjustment factor based on the state of the material to be moved.

**Data Source(s):**



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 4B  
EARTHWORK QUANTITY**

**Data Source(s):**



Project: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Prepared by: \_\_\_\_\_

# WORKSHEET 5 PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE

Earthmoving Activity: NA

Characterization of Dozer Used (type, size, etc.):

Description of Dozer Use (origin, destination, grade, haul distance, material, etc.):

## Productivity Calculations:

$$\begin{aligned} \text{Operating Adjustment Factor} = & \frac{\text{operator}}{\text{factor}} \times \frac{\text{material}}{\text{factor}} \times \frac{\text{efficiency}}{\text{factor}} \times \frac{\text{grade}}{\text{factor}} \\ & \times \frac{\text{weight}}{\text{correction}} \times \frac{\text{production}}{\text{method/blade}} \times \frac{\text{visibility}}{\text{factor}} \times \frac{\text{elevation}}{\text{factor}} = \end{aligned}$$

$$\text{Net Hourly Production} = \frac{\text{normal hourly}}{\text{production}} \text{ LCY/hr} \times \frac{\text{operating adjustment}}{\text{factor}} = \text{LCY/hr}$$

$$\text{Hours Required} = \frac{\text{volume to be moved}}{\text{LCY}} \div \frac{\text{net hourly}}{\text{production}} \text{ LCY/hr} = \text{hr}$$

Data Source(s):



Project: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Prepared by: \_\_\_\_\_

# **WORKSHEET 6** **PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE—GRADING**

Earthmoving Activity:      NA

Characterization of Dozer Used (type, size, etc.):

Description of Dozer Use (% grade, effective blade width, operating speed, etc.):

## Productivity Calculations:

$$\begin{aligned} \text{Operating Adjustment Factor} = & \frac{\text{operator}}{\text{factor}} \times \frac{\text{material}}{\text{factor}} \times \frac{\text{efficiency}}{\text{factor}} \times \frac{\text{grade}}{\text{factor}} \\ & \times \frac{\text{weight}}{\text{correction}} \times \frac{\text{production}}{\text{method/blade}} \times \frac{\text{visibility}}{\text{factor}} \times \frac{\text{elevation}}{\text{factor}} = \end{aligned}$$

$$\begin{aligned} \text{Hourly Production} = & \frac{\text{average}}{\text{speed}} \text{ mi/hr} \times \frac{\text{effective blade}}{\text{width}} \text{ ft} \times 5,280 \text{ ft/mi} \times 1 \text{ ac/43,560 ft}^2 \\ & = \text{ac/hr} \end{aligned}$$

$$\text{Net Hourly Production} = \frac{\text{hourly}}{\text{production}} \text{ ac/hr} \times \frac{\text{operating adjustment}}{\text{factor}} = \text{ac/hr}$$

$$\text{Hours Required} = \frac{\text{area to be graded}}{\text{ac}} \div \frac{\text{net hourly}}{\text{production}} \text{ ac/hr} = \text{hr}$$

Data Source(s):



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 7**  
**PRODUCTIVITY AND HOURS REQUIRED FOR RIPPER-EQUIPPED DOZER USE**

**Ripping Activity:** NA

**Characterization of Dozer and Ripper Use:**

**Description of Ripping (ripping depth, cut spacing, cut length, and material to be ripped):**

**Productivity Calculation:**

$$\text{Cycle Time} = \left( \frac{\text{ft}}{\text{cut length}} \div \frac{88 \text{ ft/min}}{\text{[speed]}} \right) + \frac{\text{min}}{\text{fixed turn time}^*} = \text{min/pass}$$

$$\text{Passes/Hour} = 60 \text{ min/hr} \div \frac{\text{min/pass}}{\text{cycle time}} \times \frac{\text{efficiency}}{\text{factor}} = \text{passes/hr}$$

$$\begin{aligned} \text{Volume Cut/Pass} &= \left( \frac{\text{ft}}{\text{tool penetration}} \times \frac{\text{ft}}{\text{cut spacing}} \times \frac{\text{ft}}{\text{cut length}} \right) \div 27 \text{ ft}^3/\text{yd}^3 \\ &= \text{BCY/pass} \end{aligned}$$

$$\text{Hourly Production} = \text{BCY/pass} \times \text{passes/hr} = \text{BCY/hr}$$

$$\text{Hours Required} = \frac{\text{bank volume}}{\text{to be ripped}^{**}} \text{ BCY} \div \frac{\text{BCY/hr}}{\text{hourly production}} = \text{hr}$$

\* Fixed turn time depends upon dozer used. 0.25 min/turn is normal.

\*\* Remember to use the swell factor to convert from bank cubic yards to loose cubic yards when applying these data to *Worksheet 5*. Calculate separate dozer hauling of ripped material for each lift on that worksheet.

**Data Source(s):**



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 8**  
**PRODUCTIVITY AND HOURS REQUIRED FOR LOADER USE**

Earthmoving Activity:            NA

Characterization of Loader Use (type, size, etc.):

Description of Loader Use (origin, destination, grade, haul distance, etc.):

Productivity Calculations:

$$\text{Cycle time} = \frac{\text{min}}{\text{haul time (loaded)}} + \frac{\text{min}}{\text{return time (empty)}} + \frac{\text{min}}{\text{basic cycle time}} = \text{min}$$

$$\text{Net Bucket Capacity} = \frac{\text{LCY}}{\text{heaped bucket capacity}} \times \frac{\text{LCY}}{\text{bucket fill factor}^*} = \text{LCY}$$

$$\text{Hourly Production} = \frac{\text{LCY}}{\text{net bucket capacity}} \div \frac{\text{min}}{\text{cycle time}} \times \frac{\text{efficiency factor}}{60 \text{ min/hr}} = \text{LCY/hr}$$

$$\text{Hours Required} = \frac{\text{LCY}}{\text{volume to be moved}} \div \frac{\text{LCY/hr}}{\text{hourly production}} = \text{hr}$$

\* See loader section of equipment manual.

Data Source(s):



Project: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Prepared by: \_\_\_\_\_

# **WORKSHEET 9** **PRODUCTIVITY AND HOURS REQUIRED FOR TRUCK USE**

**Earthmoving Activity:**            NA

**Characterization of Truck Use (type, size, etc.):**

**Description of Truck Use (origin, destination, grade, haul distance, capacity, etc.):**

## **Productivity Calculations:**

$$\text{No. Loader Passes/Truck} = \frac{\text{truck capacity}^*}{\text{loader bucket net capacity}} \text{ LCY} \div \frac{\text{LCY}}{\text{no. loader passes/truck}} = \frac{\text{passes}}{\text{(round down to nearest whole number)}}$$

$$\text{Net Truck Capacity} = \frac{\text{loader bucket net capacity}}{\text{no. loader passes/truck}} \text{ LCY} \times \text{LCY} = \text{LCY}$$

$$\text{Loading Time/Truck} = \frac{\text{loader cycle time}}{\text{(from Worksheet 8 or 10)}} \text{ min} \times \frac{\text{no. loader passes/truck}}{\text{no. loader passes/truck}} = \text{min}$$

$$\text{Truck Cycle Time} = \frac{\text{haul time}}{\text{min}} + \frac{\text{return time}}{\text{min}} + \frac{\text{loading time}}{\text{min}} + \frac{\text{dump and maneuver time}}{\text{min}} = \text{min}$$

$$\text{No. Trucks Required} = \frac{\text{truck cycle time}}{\text{min}} \div \frac{\text{total loading time}}{\text{min}} = \text{trucks}$$

$$\text{Production Rate} = \frac{\text{net truck capacity}}{\text{LCY}} \times \frac{\text{LCY}}{\text{no. trucks}} \div \frac{\text{min}}{\text{truck cycle time}} = \text{LCY/min}$$

$$\text{Hourly Production} = \frac{\text{production rate}}{\text{LCY/min}} \times 60 \text{ min/hr} \times \frac{\text{efficiency factor}}{\text{efficiency factor}} = \text{LCY/hr}$$

$$\text{Hours Required} = \frac{\text{volume to be moved}}{\text{LCY}} \div \frac{\text{LCY/hr}}{\text{hourly production}} = \text{hr}$$

\* Use the average of the struck and heaped capacities.

**Data Source(s):**



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 10**  
**PRODUCTIVITY FOR HYDRAULIC EXCAVATOR USE (BACKHOE OR POWER SHOVEL)**

**Earthmoving Activities:** Move 800 yards to be used a fill for existing cuts.

**Characterization of the Excavator Used (type, size, etc.):** John Deere 310SG Backhoe

**Description of Excavator Used (loading geometry, materials, etc.):** JD 310SG Backhoe with a 24" bucket & 3/4 yd front loader bucket.

**Productivity Calculations:**

$$\text{Net Bucket Capacity} = \frac{.75}{\text{heaped bucket capacity}} \text{ LCY} \times \frac{.85}{\text{bucket fill factor}^*} = .64 \text{ LCY}$$

$$\text{Hourly Production} = \frac{.64}{\text{net bucket capacity}} \text{ LCY} \times 60 \text{ min/hr} \div \frac{.75}{\text{cycle time}^{**}} \text{ min} \times \frac{.75}{\text{efficiency factor}} = 28.80 \text{ LCY/hr}$$

$$\text{Hours Required} = \frac{800}{\text{volume to be handled}} \text{ LCY} \div \frac{28.80}{\text{net hourly production}} \text{ LCY/hr} = 27.78 \text{ hr}$$

\* See loader section of the equipment manual.

\*\* See excavator section of equipment manual.

**Data Source(s):**



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 11A**  
**PRODUCTIVITY OF PUSH-PULL OR SELF-LOADING SCRAPER USE**

**Earthmoving Activity:**     NA

**Characterization of Scraper Used (type, capacity, etc.):**

**Description of Scraper Use (origin, destination, grade, haul distance, capacity, etc.):**

**Productivity Calculations:**

$$\begin{array}{l} \text{Cycle} = \frac{\text{min}}{\text{Time}} = \frac{\text{min}}{\text{load time}} + \frac{\text{min}}{\text{(push-pull is per pair)}} + \frac{\text{min}}{\text{loaded trip time}} + \frac{\text{min}}{\text{maneuver and spread time}} + \frac{\text{min}}{\text{return trip time}} = \frac{\text{min}}{\text{(push-pull is per pair)}} \end{array}$$

$$\text{Hourly Production} = \frac{\text{LCY}}{\text{capacity}^*} \times 60 \text{ min/hr} \div \frac{\text{min}}{\text{cycle time}} \times \frac{\text{efficiency factor}}{\text{factor}} = \frac{\text{LCY/hr}}{\text{(push-pull is per pair)}}$$

$$\text{Hours Required} = \frac{\text{LCY}}{\text{volume to be handled}} \div \frac{\text{LCY/hr}}{\text{net hourly production}} = \text{hr}$$

\* The average of the struck and heaped capacities; use total for two scrapers for push-pull.

**Data Source(s):**



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 11B**  
**PRODUCTIVITY OF DOZER PUSH-LOADED SCRAPER USE**

Earthmoving Activity:      NA

Characterization of Scraper Used (type, capacity, etc.):

Description of Scraper Use (origin, destination, grade, haul distance, capacity, etc.):

List Pusher Tractor(s) Used:

Describe Push Tractor Loading Method (see figure on next page):

Scraper Productivity Calculations:

$$\text{Cycle Time} = \frac{\text{min}}{\text{load time}} + \frac{\text{min}}{\text{loaded trip time}} + \frac{\text{min}}{\text{maneuver and spread time}} + \frac{\text{min}}{\text{return trip time}} = \text{min}$$

$$\text{Hourly Production} = \frac{\text{LCY}}{\text{capacity}^*} \times 60 \text{ min/hr} \div \frac{\text{min}}{\text{cycle time}} \times \frac{\text{min}}{\text{efficiency factor}} = \text{LCY/hr}$$

$$\text{Hours Required} = \frac{\text{LCY}}{\text{volume to be handled}} \div \frac{\text{LCY/hr}}{\text{hourly production}} = \text{hr}$$

\* Use the average of the struck and heaped capacities.

Push Tractor Productivity Calculations:

$$\text{Pusher Cycle Time} = \frac{\text{min}}{\text{scraper load time}} \times \frac{\text{min}}{\text{pusher factor}} = \text{min}$$

$$\text{Scrapers/Pusher} = \frac{\text{min}}{\text{scraper cycle time}} \div \frac{\text{min}}{\text{pusher cycle time}} = \text{scrapers}$$

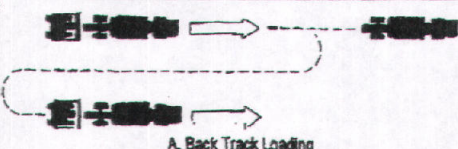
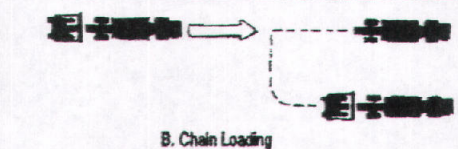
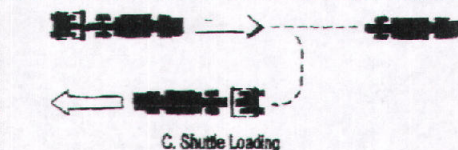
$$\text{Pusher Hours Required} = \frac{\text{hr}}{\text{scraper hours}} \div \frac{\text{scrapers per pusher}}{\text{(round up)}} = \text{hr}$$

Data Source(s):



Project: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Prepared by: \_\_\_\_\_

**WORKSHEET 11B (continued)**  
**PRODUCTIVITY OF DOZER PUSH-LOADED SCRAPER USE**

PUSHER FACTORS	Single Push	Tandem Push
 <p>A. Back Track Loading</p>	1.5	2.0
 <p>B. Chain Loading</p>	1.3	1.5
 <p>C. Shuttle Loading</p>	1.3	1.5

Modified from Terex, 1981.

The following disclaimer pertains to the above illustration from Terex, "Production and Cost Estimating of Material Movement and Earthmoving Equipment."

This manual is a fundamental text on estimating the production and cost of moving materials. It is intended for people associated with the construction industry who prepare job estimates or who evaluate the performance of earthmoving equipment and related costs.

The manual can be used as a supplementary text in those schools and colleges offering formal training in earthmoving techniques. A metric version of this manual is also available.

It will also serve as a reference for those professional consulting engineers who prepare complete job analyses, of which the earthmoving fundamentals covered in this text are only one element.

Estimating the production and costs of earthmoving equipment is not an exact science. While this manual outlines the basic factors or parameters on which estimates can be made, the user must make judgements, and must apply his own experience and know-how to temper the estimate.

This manual, prepared by TEREX, deals with rubber-tired and track-laying equipment, and does not attempt to deal with other forms of earthmoving or production. While the formulas and other guides in this manual are entirely satisfactory for most earthmoving jobs, the reader should note that more sophisticated haulage analyses can be quickly accomplished through the use of a computer.

While efforts have been made to utilize percentages, formulas, and other notations in this manual which reflect actual on-the-job conditions, none of the statements in this manual, or the illustrative figures given for machine life, or the costs for owning and operating earthmoving equipment, or the production of such earthmoving equipment should be construed as any form of guarantee that these machines will have any such specific service life, or production capabilities, or that costs related to their ownership and operation will be as indicated.

**Data Source(s):** TEREX AMERICAS, Tulsa, OK 74107, (918) 445-5802.



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 12**  
**PRODUCTIVITY AND HOURS REQUIRED FOR MOTORGRADER USE**

**Earthmoving Activity:** Grading roads and site to match terrain.

**Characterization of Grader Used (type, size capacity, etc.):** John Deere 670G Grader

**Description of Grader Route (push distance, grade, effective blade width, operating speed, etc.):**

Push distance of 156' a blade width of 12' and operating speed of 2.4 mph to 28.1 mph.

**Productivity Calculations:**

**Grading**

$$\begin{aligned} \text{Hourly Production} &= \frac{5}{\text{average speed}} \text{ mi/hr} \times \frac{12}{\text{effective blade width}} \text{ ft} \times 5,280 \text{ ft/mi} \times 1 \text{ ac}/43,560 \text{ ft}^2 \\ &\times \frac{20\%}{\text{efficiency factor}} = 1.46 \text{ ac/hr} \end{aligned}$$

$$\text{Hours Required} = \frac{4.51}{\text{area to be graded}} \text{ ac} \div \frac{1.46}{\text{hourly production}} \text{ ac/hr} = 6.59 \text{ hr}$$

**Scarification**

$$\begin{aligned} \text{Hourly Production} &= \frac{\text{NA}}{\text{average speed}} \text{ mi/hr} \times \frac{\text{scarifier width}}{\text{scarifier width}} \text{ ft} \times 5,280 \text{ ft/mi} \times 1 \text{ ac}/43,560 \text{ ft}^2 \\ &\times \frac{\text{efficiency factor}}{\text{efficiency factor}} = \text{ac/hr} \end{aligned}$$

$$\text{Hours Required} = \frac{\text{area to be scarified}}{\text{area to be scarified}} \text{ ac} \div \frac{\text{hourly production}}{\text{hourly production}} \text{ ac/hr} = \text{hr}$$

**Total Hours Required**

$$\text{Total Hours} = \frac{6.59}{\text{grading hours required}} + \frac{\text{scarification hours required}}{\text{scarification hours required}} = 6.59 \text{ hr}$$

**Data Source(s):**



Project: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Prepared by: \_\_\_\_\_

**WORKSHEET 13**  
**SUMMARY CALCULATION OF EARTHMOVING COSTS**

Equipment *	Ownership & Operation Cost (\$/hr)	Labor Cost (\$/hr)	Total Hours Required **	Total Cost *** (\$)
Backhoe	\$95.00	\$25.00	27.78	\$3,333.33
Grader	\$125.00	\$25.00	6.59	\$988.27
<b>Grand Total</b>				<b>\$4,321.60</b>
* Include all necessary attachments and accessories for each item of equipment. Also, add support equipment such as water wagons and graders to match total project time as appropriate.  ** Account for multiple units in truck and/or scraper teams.  *** To compute Total Cost: Add Ownership & Operation Cost and Labor Cost columns then multiply by Total Hours Required column.				

Data Source(s):



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

## WORKSHEET 14 REVEGETATION COSTS

Name and Description of Area To Be Revegetated:

Description of Revegetation Activities:

Cost Calculation for Individual Revegetation Activities:

### Initial Seeding

$$\frac{4.51}{\text{area to be seeded}} \text{ ac} \times \left( \$ \frac{75.00}{\text{seedbed preparation}} / \text{ac} + \$ \frac{250.00}{\text{seeding, fertilizing \& mulching}} / \text{ac} \right) = \$ 1,465.75$$

### Planting Trees and Shrubs

$$\frac{\text{NA}}{\text{area to be planted}} \text{ ac} \times \left( \$ \frac{\quad}{\text{planting}} / \text{ac} + \$ \frac{\quad}{\text{herbicide treatment}} / \text{ac} \right) = \$ \quad$$

### Reseeding

$$\frac{\text{NA}}{\text{area to be seeded \& unreleased disturbed areas}} \text{ ac} \times \frac{\quad}{\text{failure rate}^*} \times \left( \$ \frac{\quad}{\text{seedbed preparation}} / \text{ac} + \$ \frac{\quad}{\text{seeding, fertilizing \& mulching}} / \text{ac} \right) = \$ \quad$$

### Replanting Trees and Shrubs

$$\frac{\text{NA}}{\text{area to be planted \& unreleased disturbed areas}} \text{ ac} \times \frac{\quad}{\text{failure rate}^*} \times \left( \$ \frac{\quad}{\text{planting}} / \text{ac} + \$ \frac{\quad}{\text{herbicide treatment}} / \text{ac} \right) = \$ \quad$$

### Other Necessary Revegetation Activities

(Examples of other activities that may be necessary include soil sampling, irrigation, and rill and gully repair. Describe each activity and provide a cost estimate with documentation. Use additional worksheets if necessary.)

Other Costs = \$ NA

TOTAL REVEGETATION COST = \$ 1,465.75

\* Identify failure rate and basis. If anticipated failure rates vary within the area proposed for disturbance, use a separate worksheet for the area subject to each failure rate.

Data Source(s):



Project: \_\_\_\_\_  
Date: \_\_\_\_\_  
Prepared by: \_\_\_\_\_

**WORKSHEET 15**  
**OTHER RECLAMATION ACTIVITY COSTS**

*(Subsidence damage repair costs, water supply replacement costs, funds required to support long-term treatment of unanticipated acid or ferruginous mine drainage, etc.)*

**Description of Reclamation, Repair or Pollution Abatement Activity:**

Seal 3 mine portals with solid grouted cmu block.

Portal 1	8' X 8' opening	64 sq ft
Portal 2	8' X 8' opening	64 sq ft
Portal 3	8' X 10' opening	80 sq ft
	Total	208 sq ft

**Assumptions:**

**Cost Estimate Calculations:**

208 sq ft x \$25.00 per sq ft = \$5,200.00

**TOTAL COSTS = \$ 5,200.00**

**Other Documentation or Notes:**

*(Include additional sheets, maps, calculations, etc., as necessary to document estimate.)*

**Data Source(s):**



## ***Denning Construction***

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1967 N. Cascade Canyon Drive, St George, Utah 84770  
(801) 556-6776 Cel  
e-mail [rquindenning@hotmail.com](mailto:rquindenning@hotmail.com)

### ***Estimate***

Scope of Work: Mobilization and Demobilization to Reclaim the disturbed area of the Brett Clark Mine and revegetate.

Location: Brett Clark Mine, Emery County, Utah

#### **Specifications:**

Mobilization	\$1,000.00
Demobilization	\$1,000.00

Total Cost	\$2,000.00
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#### **Payment Schedule:** 50% Down - Balance Due upon completion

(Note Any amounts not paid as agreed will be charged a finance charge of 1.5% per month along with all reasonable legal and collection fees.)

#### **Job Guarantee:**

This job to be completed in a timely manner. All work to be preformed in a good workmanlike fashion.

Submitted by

February 10, 2010

  
\_\_\_\_\_  
R. Quin Denning